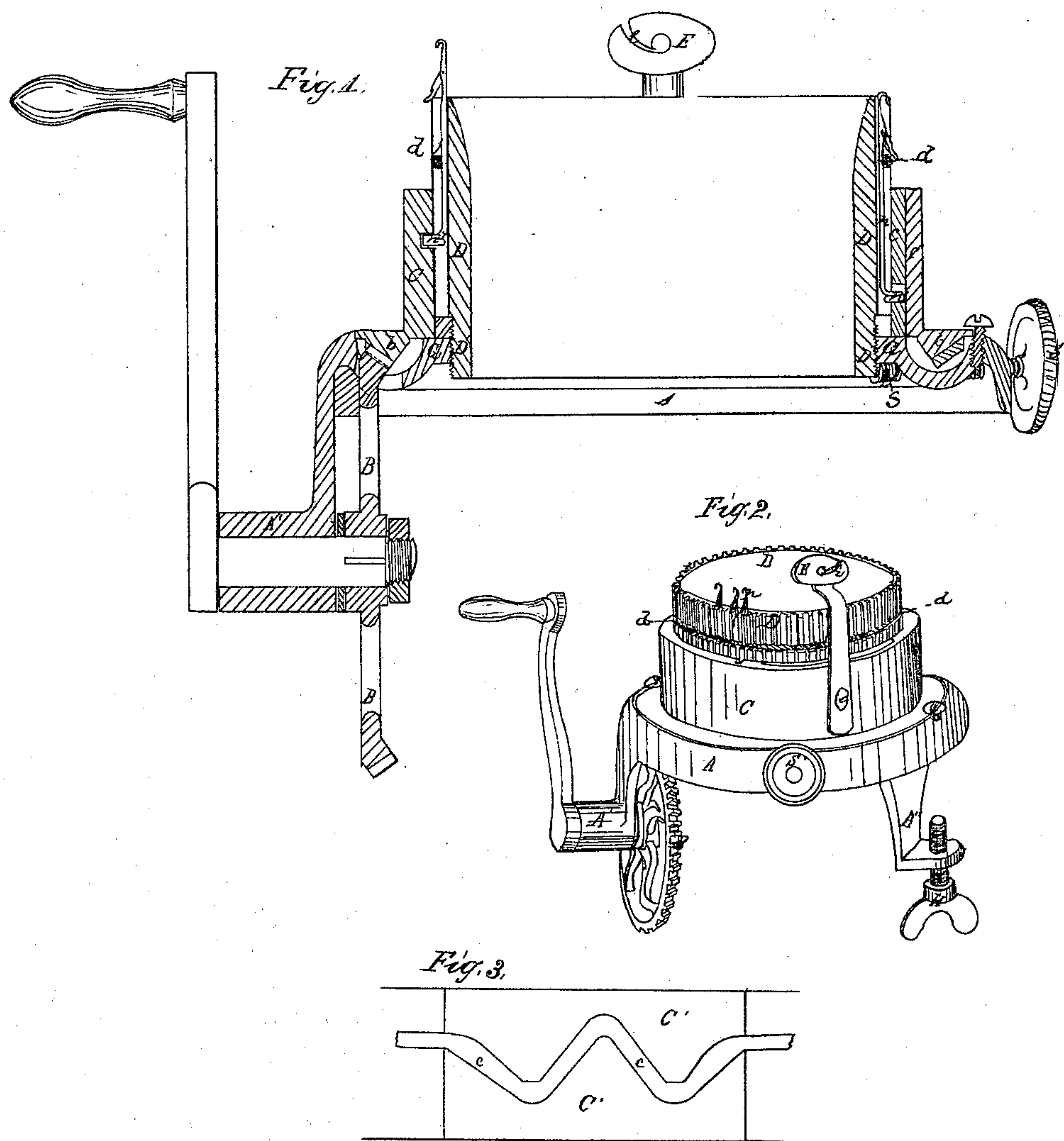


O. TWOMBLY & W. NOYES, Jr.
KNITTING MACHINE.

No. 79,789.

Patented July 7, 1868.



Witnesses
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ORISON TWOMBLY, OF HOLDERNESS, NEW HAMPSHIRE, AND WILLIAM NOYES, JR., OF NEWBURYPORT, MASSACHUSETTS.

Letters Patent No. 79,789, dated July 7, 1868.

IMPROVEMENT IN KNITTING-MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that we, ORISON TWOMBLY, of Holderness, in the county of Grafton, and State of New Hampshire, and WILLIAM NOYES, Jr., of Newburyport, in the county of Essex, and State of Massachusetts, have invented certain new and useful Improvements in Knitting-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a transverse vertical section of our machine.

Figure 2 is a perspective view of the same; and

Figure 3 is a view of the cam-way or groove on the interior of the shell-gear.

Similar letters indicate like parts in the several figures.

The general features of our machine are similar to some of those in common use, in which are employed a series of vertical needles, that are raised and lowered by a rotating cam.

And the nature of our invention consists of a needle-cylinder, provided, at its base, with a screw-thread, that fits within a female screw in the bed-plate, and in combining with the same a cam, immovably attached to the inner side of the shell-gear, so that, by screwing the needle-cylinder in and out from the bed-plate, the cylinder will be raised or lowered relatively to the same, causing the needles to form longer or shorter stitches in the work. The needle-cylinder is held in position by means of a set-screw passing through the bed-plate at one side.

Referring to the drawings, A A' A'' represent the bed-plate, the portions A', which forms the bearing for the shaft of the driving-bevel wheel B, and A'', which forms the clamp, being cast in one piece with the bed-plate.

By the use of an elastic cord, the needles may be readily removed and replaced at any time by simply drawing back a portion of the cord. A rigid or unyielding band of metal has been used for retaining the needles in place in circular knitting-machines, but such band requires to be entirely removed when the needles are to be taken out.

B represents the bevel-gear wheel, which engages with and drives the gear *b* of the shell C. To the inner side of the shell C is permanently attached the plate C', in which is the cam-way or groove *c*.

The cam is so constructed and arranged as to enable the shell-gear to be turned in either direction, and thus admit of a reciprocal motion of the yarn-carrier, for knitting a straight piece of work, of any desired width, with selvedge.

D is the needle-cylinder, formed with recesses, for holding the needles *n*.

Surrounding the needle-cylinder D is a groove, in which is fitted an elastic cord or band, *d*, for the purpose of retaining the needles in place.

On the lower outer portion of the needle-cylinder D is formed a screw-thread, as shown at D', which fits within a corresponding female screw in the portion G of the bed-plate A, so that, by loosening the screw S, and turning the needle-cylinder in one or the other direction, it will be elevated or lowered, carrying with it the needles *n*, so that the projecting lower ends *n'* of the needles will be correspondingly adjusted to the cylinder D, and thus cause the needles to make a longer or shorter stitch or loop, as desired. The needle-cylinder may be easily rotated in either direction, and is held in position by means of a set-screw, *s s'*, passing through the bed-plate, and bearing against the screw D', as shown in fig. 1.

The machine may thus be readily adapted to make longer and looser or shorter and tighter stitches or loops, at any time during its operation, by simply turning the screw S, and releasing the needle-cylinder, the amount of elevation or depression being readily determined by the eye, without the necessity of a gauge for the purpose.

E is the yarn-carrier, attached, in the usual manner, to the shell-gear C. It is provided with a curved slot, *e*, as shown in figs. 1 and 2, so that the yarn may be readily slipped out or detached from the same, and thus

enable a circular knitting-machine to knit around any portion of the circle, for the purpose of knitting a straight piece of work with selvedge, and the work may be of a regular or varying width. In this way, a machine having a rotating motion only in one direction may knit straight work of any width, the operation being as follows: Any number of needles, from one to nearly as many as there are in the needle-carrier, may be inserted. When one row of the desired width is knit, the yarn is slipped out from the yarn-carrier, and brought back, over and around the needles, to the starting-point. The shell-gear turns all the way round, and, at the proper place, the yarn is again inserted in the carrier, when the stitches are again taken up and carried to the same place as before, and so the operation is repeated. In order to vary the width, the number of needles may be gradually increased or diminished as the work proceeds.

The machine may be attached to a table, shelf, or other article, and firmly secured to the same by means of the clamp A'' and screw H.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The needle-cylinder D, provided with a screw-thread, D', in combination with the cam C, screw S', and bed-plate A, constructed and operating substantially as and for the purpose specified.

2. The needle-cylinder D, provided with a screw-thread, D', in combination with the reversible cam C, slotted thread-guide E, screw S', and bed-plate A, substantially as and for the purpose set forth.

In testimony whereof, we have signed our names to this specification in the presence of two subscribing witnesses.

ORISON TWOMBLY,
WM. NOYES, JR.

Witnesses:

J. H. ADAMS,
M. S. G. WILDE.